



**UNIVERSITI PUTRA MALAYSIA**

**FINANCIAL REPORTING OF INTANGIBLE ASSETS: THE  
REALIBILITY OF MEASUREMENT METHODS**

**LAU CHEE KWONG**

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**FINANCIAL REPORTING OF INTANGIBLE ASSETS:  
THE RELIABILITY OF MEASUREMENT METHODS**

**By**

**LAU CHEE KWONG**

**Thesis Submitted to the Graduate School of Management,  
University Putra Malaysia, in Fulfillment of the  
Requirement for the Degree of Doctor of Philosophy**

**January 2008**



## **DEDICATION**

**To my wife, Khor Kah Houn; our children,  
Lau Chee Lock, Lau Chee Yoong and Lau Chee Ie;  
and my parents, Lau Hon and Chin Ah Mooi  
for their patience and support.**



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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**January 2008**

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**Faculty: Graduate School of Management**

Intangible resources have become increasingly important since the 1990s and most of the major world economies have shifted their focus to become knowledge-based economies. Consequently, many researchers are questioning the decision usefulness of information contained in financial statements. Failure to report the substance of intangible resources has been identified as one of the major root causes. The existing asset recognition criteria, which emphasize measurement reliability has made it difficult for most of the intangible resources to be recognized as assets in the balance sheets. Based on the fact that measurement reliability is an issue in the recognition of intangible assets in financial reporting, this study asks the question: whether the estimated fair values of intangible assets derived from the selected measurement methods, faithfully represent the market value of the assets. This study aims to analyze the reliability of the selected measurement methods used in estimating the fair value of intangible assets.

This study adopts the price model used in the relevant literature as the basis for theoretical framework. Fair values of intangible assets estimated using the selected

measurement methods have been used to study their association with market values. Coefficient of correlation, coefficient of slope and coefficient of determination are employed to ascertain the significance and degree of representational faithfulness, which serves as a proxy to measurement reliability.

This study finds that measurement methods based on abnormal cash flow and earnings produced fair value of intangible assets, which are representational faithful to their respective market values. This provides empirical evidence that the measurement methods are reliable in estimating the fair value of intangible assets. This study concludes that measurement reliability, via its proxy – representational faithfulness, is market verifiable and need not necessarily be mutually exclusive with relevance, which is another qualitative characteristic of decision usefulness. The findings and conclusions are vital in supporting the pervasive use of fair value measurement in financial reporting. This will eventually improve the quality of financial reporting of intangible assets and decision usefulness of accounting information. In a more recent development, the International Accounting Standards Board proposes to replace measurement reliability with representational faithfulness as a qualitative characteristic of decision useful information.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia  
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**LAPORAN KEWANGAN UNTUK ASET INTANGIBEL:  
RELIABILITI KAEDAH PENGUKURAN**

Oleh

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Sumber intangibel telah menjadi semakin penting sejak tahun 1990an dan kebanyakan ekonomi dunia telah mengalir fokus kepada ekonomi yang berasaskan ilmu. Sehubungan dengan ini, ramai penyelidik mempertikaikan tahap kebergunaan maklumat yang terkandung dalam penyata kewangan. Kegagalan dalam melaporkan sumber intangibel telah dikatakan sebagai salah satu punca utama pertikaian tersebut. Pada masa kini, kriteria pengiktirafan aset yang lebih mementingkan reliabiliti pengukuran telah menyukarkan kebanyakan sumber intangibel untuk diiktirafkan sebagai aset dalam kunci kira-kira. Berdasarkan kepada isu reliabiliti pengukuran dalam pengiktirafan aset intangibel dalam laporan kewangan, tesis ini menyoalkan samada nilai saksama yang ditaksir untuk aset intangibel, dengan menggunakan kaedah pengukuran yang terpilih, dapat menunjukkan nilai pasaran aset tersebut dengan tepat. Tesis ini bertujuan menyelidik reliabiliti kaedah pengukuran yang terpilih dalam menaksir nilai saksama aset intangibel.

Tesis ini menggunakan model harga yang digunakan dalam literatur yang berkaitan sebagai asas rangka teoretikal. Nilai saksama yang ditaksir dengan menggunakan

kaedah pengukuran yang terpilih telah digunakan untuk dikaitkan dengan nilai pasaran bagi menganalisis perhubungan antara nilai tersebut. Koefisien korelasi, koefisien kekeliruan dan koefisien determinasi telah digunakan untuk mengukur signifikan dan tahap “representational faithfulness”, dimana “representational faithfulness” merupakan proksi kepada reliabiliti pengukuran.

Kajian ini mendapati bahawa kaedah pengukuran berdasarkan aliran tunai dan keuntungan tidak lazim membolehkan penaksiran nilai saksama yang mewakili nilai pasaran aset tersebut dengan tepat. Ini membuktikan bahawa kaedah pengukuran yang terpilih dapat menaksir nilai saksama aset intangibel dengan reliabel. Tesis ini menyimpulkan bahawa reliabiliti pengukuran, dengan menggunakan proksi “representational faithfulness”, dapat dibuktikan benar oleh pasaran dan ia tidak semestinya bercanggah dengan relevan, iaitu salah satu lagi ciri kualitatif maklumat berguna. Kesimpulan ini adalah penting untuk menyokong penggunaan pengukuran nilai saksama dengan lebih luas di masa akan datang dalam bidang laporan kewangan. Ini dijangka akan pertingkatkan kualiti pelaporan kewangan bagi aset intangibel dan kebergunaan maklumat perakaunan. Dalam satu perkembangan baru ini, Lembaga Piawaian Perakaunan Antarabangsa mencadang supaya reliabiliti pengukuran digantikan dengan “representational faithfulness” sebagai ciri kualitatif maklumat yang berguna.

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Associate Professor Dr Arfah Salleh started as my academic advisor and subsequently became the Chair of my Supervisory Committee. Despite her busy schedule as the Dean of Graduate School of Management, Universiti Putra Malaysia, she has constantly devoted her effort in providing guidance, monitoring the progress as well as adding value to my research.

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I certify that an Examination Committee met on 26<sup>th</sup> October 2007 to conduct the final examination of Graduate Student on his Doctor of Philosophy thesis entitled “Financial Reporting of Intangible Assets: the Reliability of Measurement Methods” in accordance with Universiti Putra Malaysia (Higher Degree) Act 1980 and Universiti Putra Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

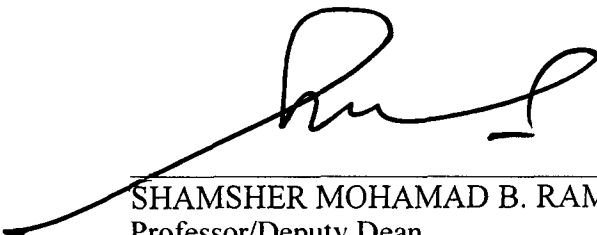
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## DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.



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LAU CHEE KWONG

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## **LIST OF ABBREVIATIONS**

<b>AASB</b>	<b>Australian Accounting Standards Board</b>
<b>CIV</b>	<b>Calculated Intangible Value Method</b>
<b>CAPM</b>	<b>Capital Asset Pricing Model</b>
<b>CASB</b>	<b>Canadian Accounting Standards Board</b>
<b>CSR</b>	<b>Clean Surplus Relation</b>
<b>DIC</b>	<b>Direct Intellectual Capital Approach</b>
<b>DCF</b>	<b>Discounted Cash Flow Method</b>
<b>DVM</b>	<b>Dividend Valuation Model</b>
<b>EVA</b>	<b>Economic Value Added Model</b>
<b>ED</b>	<b>Exposure Draft</b>
<b>FASB</b>	<b>Financial Accounting Standards Board</b>
<b>FRS</b>	<b>Financial Reporting Standard</b>
<b>FEM</b>	<b>Fixed Effects Regression Model</b>
<b>GAAP</b>	<b>Generally Accepted Accounting Principles</b>
<b>HAC</b>	<b>Heteroscedasticity and Autocorrelation Consistent</b>
<b>IRS</b>	<b>Internal Revenue Service</b>
<b>IAS</b>	<b>International Accounting Standard</b>
<b>IASB</b>	<b>International Accounting Standards Board</b>
<b>IASC</b>	<b>International Accounting Standard Committee</b>
<b>IFRS</b>	<b>International Financial Reporting Standard</b>
<b>KCE</b>	<b>Knowledge Capital Earnings Model</b>
<b>MASB</b>	<b>Malaysian Accounting Standards Board</b>
<b>MESDAQ</b>	<b>Malaysia Exchange of Securities Dealing and Automated Quotation</b>
<b>MICPA</b>	<b>Malaysian Institute of Certified Public Accountants</b>



MTP	Multiples Method
NOPAT	Net Operating Profit After Taxes
PE	Price Earnings
OECD	Organization of Economic Cooperation and Development
ECM	Random Effects Model or Error Components Model
RIM	Residual Income Model
ROA	Return on Assets
SC	Scorecard Approach
SFAC	Statements of Financial Accounting Concepts
SFAS	Statement of Financial Accounting Standard
SNA	System of National Accounts



# CHAPTER 1

## INTRODUCTION

The importance of intangible resources becomes apparent in the 1990s when most of the major world economies shifted their focus from an industrial-based economy to a knowledge-based economy. An industrial-based economy focuses its investments in tangible assets and a knowledge-based economy<sup>1</sup> focuses its investments in intangible assets. Lev (1999) showed a very different investment perspective since 1929, when approximately 70% of the U.S. investments were used to finance tangible goods and some 30% for intangibles. However, by 1990 this pattern was reversed, and the dominant investments in the U.S. were used to finance intangibles such as research and development, education and competencies, information technology software and the Internet. Blair (1999 cited in Sullivan and Sullivan, 2000) studied the shift in the composition of company assets of thousands of non-financial U.S. companies over the 20-year period from 1978 to 1998. Her study revealed a significant shift in the relationship between tangible and intangible assets over time. She found that in 1978 tangible and intangible assets accounted for 80% and 20% of the corporate value, respectively; by 1998 the proportions were reversed, with 80 percent of corporate value associated with intangible assets and only 20 percent with tangible assets.

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<sup>1</sup> The Organization of Economic Cooperation and Development (OECD, 1996) defined a knowledge-based economy as an economy which is directly based on the production, distribution and use of knowledge and information. A knowledge-based economy is characterized by high investment in research and development, high literacy rates, high tertiary education enrolment, good technology-related capacity and skills, strength in innovation, and high information and communication technology penetration and Internet usage.



In Malaysia, under its Knowledge-based Economy Master Plan (2000), business firms in the private sector are expected to assume a more critical role in order to spearhead the development towards a knowledge-based economy. Substantial capital would be required for investments in the creation of knowledge, increasing knowledge and intellectual content (as well as intangible assets) in the activities of business firms, and for investments in new knowledge-based industries. Under the Master Plan (2000), many business firms have been set up as knowledge-based or transformed from production-based to knowledge-based with the goal to gain higher returns. This move has attracted more capital investments to finance the production and acquisition of intangible assets. In fact, a number of these firms have been successfully listed on the Bursa Malaysia especially since the refocus move to a knowledge-based economy (Multimedia Development Corporation, 2004).

While most countries, whether in the international front or Malaysia, are transforming their economies into knowledge-based and creating more intangible assets in the economies to drive value, there are comments criticizing that financial statements and accounting information are losing their relevance and decision usefulness is deteriorating. One of the major criticisms is that the current financial reporting system unable to report the substance of intangible assets, which become so important in the knowledge-based economy. Due to the stringent asset recognition criteria, especially the requirement of measurement reliability, intangible assets are not being properly represented in the financial statements. Consequently, the decision usefulness of financial statements and accounting information pertaining to intangible assets is at stake. This would distort the financial position and performance of the business firms. This is especially so for business firms with high level of unrecognized intangible

assets. In fact, empirical evidence on deteriorating decision usefulness of financial reporting and its consequences is pervasively found.

### 1.1 Decision Usefulness of Financial Reporting

Many researchers are questioning about the quality and relevance of information contained in the financial statements. For instance, Collins et al. (1997) and Francis and Schipper (1999) explored the relevance of financial statements and information reported under the existing reporting framework. They found that the relevance of financial statements and the associated financial information has been deteriorating as compared to the past. One of the major reasons for such deterioration is the way business entities report intangible assets. Lev and Zarowin (1999) also documented the same result, where the usefulness of reported earnings, cash flows and book values has been deteriorating as compared to the past. Similarly, one of the major reasons put forward is the failure of the accounting system in reporting intangible assets.

The decision usefulness of financial reporting, its financial statements as well as the associated accounting information was first became questionable when there is a widening of book value to market value gap among the public listed companies in many of the stock exchanges around the world (see Litan and Wallison, 2000; Brennan and Connell, 2000; Lev, 2001; Guthrie et al., 2001; Rodov and Leliaert, 2002; Lau and Tan, 2002). Book value (accounting valuation) is based on the reporting entity's reported net assets figure, which is a product of the production-based reporting framework. On the other hand, market value (economic valuation) is a perceived figure of the total net

assets of the reporting entity by market participants. This perceived figure is attributable to the reported net assets and any value of other assets which are not recognized under the reporting framework. Since tangible assets are more likely to meet the asset recognition criteria and being recognized as assets, these unrecognized assets are very likely to be consisting of intangible assets or intellectual capital inherent in the reporting entity (Lau, 2002).

In fact, the users of financial statements are aware of the mismatch between the economic substance of business firms with what has been reported. In substance, intangible assets contribute to the financial position and performance of business firms but they are not properly represented in the financial reporting. This creates demand for financial information about intangible assets, especially the unrecognized intangibles. For instance, Upton (2001) looked at the importance of information on intangibles reporting from the users' point of view. According to Upton (2001), many commentators have remarked on what they considered to be a disconnection between information provided in financial statements and the informational needs of investors and creditors. Most recently, some have characterized this as a disconnection between "new economy" companies and "old economy" financial reporting. In particular, many have contended that financial statement users need more information about intangible assets. Such demands were mainly due to the asymmetry of information between the market investors and the reporting entities on the intangible assets.

The failure to value and report intangible assets is also being associated with various capital market problems. Leadbeater (1999) and Rodgers (2003) linked the deficiency of intangible asset reporting to problems like insider trading risk, higher cost of capital,



misallocation of capital, decreased incentives for entrepreneurs and knowledge workers as well as increased market volatility.

From an information perspective, these market issues arise due to the asymmetry of information on intangible assets. Besides, non-recognition and the fact that no value is being assigned to the assets make the performance measurement and recognition of entrepreneurs and knowledge workers difficult. This may discourage and decrease the expected incentives for them to continue contributing to the intangible investments and creation of the assets.

## 1.2 Financial Reporting of Intangible Assets

From the perspective of financial reporting, intangible assets are relatively difficult, as compared to tangible and financial assets, in meeting the asset recognition criteria established in accordance with the current Generally Accepted Accounting Principles (GAAP) (See Tollington, 1998; Gunther et al., 2002; Wyatt, 2003). In general, the *Framework for the Preparation and Presentation of Financial Statements* (the *Framework*) issued by the International Accounting Standard Committee<sup>2</sup> (IASC) (1988) establishes the asset recognition criteria. The *Framework*<sup>3</sup> is applicable to reporting regimes adopting the international financial reporting standards or issuing

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<sup>2</sup> The International Accounting Standards Committee (IASC) has been restructured in 2001 and since then changed its name to the International Accounting Standards Board (IASB)

<sup>3</sup> In the year 1998, the Malaysian Accounting Standards Board (MASB) has also prepared a discussion paper on a *Proposed Framework for the Preparation and Presentation of Financial Statements* (MASB, 1998a). The Proposed Framework is in full compliance with the *IASC Framework*.